CLAIMS

1. A hole transport material to be used for a layer having the function of transporting holes in an organic EL device, the hole transport material being characterized in that when the hole transport material is dissolved or dispersed in a liquid so that its concentration becomes 2.0 wt%, the liquid contains nonionic impurities having a molecular weight of 5,000 or less, but an amount of the nonionic impurities contained therein is 40 ppm or less.

2. The hole transport material as claimed in claim 1, wherein the nonionic impurities mainly include those which are formed and/or mixed when synthesizing the hole transport material.

3. The hole transport material as claimed in claim 1, wherein the nonionic impurities include at least one of polyalcohol and heterocyclic aromatic compound.

4. The hole transport material as claimed in claim 1, wherein the hole transport material includes at least one selected from the group comprising thiophene/styrenesulfonate-based compounds, arylcycloalkane-based compounds, arylamine-based compounds, phenylenediamine-based compounds, carbazole-based compounds, stilbene-based compounds, oxazole-based compounds, triphenylmethane-based compounds, pyrazoline-based compounds, benzine-based compounds, triazole-based compounds, imidazole-based compounds, oxadiazole-based compounds, anthracene-based compounds, fluorenone-based compounds, aniline-based compounds, silane-based compounds, thiophene-based compounds, pyrrole-based compounds, florene-based compounds, porphyrin-based compounds, quinacridon-based compounds, phthalocyanine-based compounds, naphthalocyanine-based compounds, and benzidine-based compounds.

5. The hole transport material as claimed in claim 1, wherein the hold transport material contains a poly(thiophene/styrenesulfonate)-based compound as its major component, and wherein when the hole transport material is dissolved

or dispersed in a liquid so that its concentration thereof becomes 2.0 wt%, the liquid contains nonionic impurities having a molecular weight of 5,000 or less, but an amount of the nonionic impurities contained therein is six or less with respect to 1,000 styrene units.

6. The hole transport material as claimed in claim 5, wherein the number of the nonionic impurities and the number of the styrene units are measured from areas of peaks in a spectrum obtained by an ^{1}H-NMR analysis for the liquid.

7. The hole transport material as claimed in claim 5, wherein the poly(thiophene/styrenesulfonate)-based compound has a weight ratio of thiopene to styrenesulfonate which is in the range of 1:5 to 1:50.

8. The hold transport material as claimed in claim 1, wherein the volume resistivity of the hole transport material is 10 Ω·cm or larger.

9. A layer having the function of transporting holes and provided in an organic EL device, wherein the layer is characterized by containing nonionic impurities having a molecular weight of 5,000 or less, but an amount of the nonionic impurities is 2,000 ppm or less.

10. A layer having the function of transporting holes and provided in an organic EL device, the layer being formed from a hole transport material containing poly(thiophene/styrenesulfonate)-based compound as its major component, wherein the layer contains nonionic impurities having a molecular weight of 5,000 or less, but an amount of the nonionic impurities contained therein is 6 or less with respect to 1000 styrene units.

11. The layer as claimed in claim 10, wherein the number of the nonionic impurities and the number of the styrene units are measured from areas of peaks in a spectrum obtained by an ^{1}H-NMR analysis for the layer.

12. A layer having the function of transporting holes and provided in an organic EL device, the layer being characterized by being formed from a material containing the hole transport material described in claim 1 as its major component.

13. An organic EL device having a layer described in claim 9.

14. A method of manufacturing a hole transport material described in claim 1, the method comprising the steps of:

preparing a solution or dispersion liquid in which the hole transport material is dissolved or dispersed in a solvent or a dispersion medium;

separating or eliminating nonionic impurities having a molecular weight of 5,000 or less using an eliminating means for separating or eliminating the nonionic impurities; and

removing the solvent or dispersion medium from the liquid, thereby refining the hole transport material.

15. The method of manufacturing a hole transport material as claimed in claim 14, wherein the eliminating means includes an ultrafiltration membrane.

16. A hole transport material to be used for a layer having the function of transporting holes in an organic EL device, the hole transport material being characterized in that when the hole transport material is dissolved or dispersed in a liquid so that its concentration becomes 2.0 wt%, the liquid contains anionic impurities, cationic impurities and nonionic impurities having a molecular weight of 5,000 or less, but amounts of the anionic impurities, cationic impurities and nonionic impurities contained therein are 30 ppm or less, 30 ppm or less and 40 ppm or less, respectively.

17. The hole transport material as claimed in claim 16, wherein when the hole transport material is dissolved or dispersed in a liquid so that its concentration becomes 2.0 wt%, the total amount of the anionic impurities, cationic impurities and nonionic impurities contained therein is 90 ppm or less.

18. The hole transport material as claimed in claim 16, wherein the anionic impurities include at least one of sulfate ion, formate ion, oxalate ion and acetate ion.

19. The hole transport material as claimed in claim 16, wherein the cationic impurities mainly include metal ion.

20. The hole transport material as claimed in claim 19, wherein the metal ion includes at least one kind of metal ions of metals belonging to Ia group, IIa group, VIa group, VIIa group, VIII group and IIb group of the periodic table.

21. The hole transport material as claimed in claim 16, wherein the nonionic impurities mainly include those which are formed and/or mixed when synthesizing the hole transport material.

22. The hole transport material as claimed in claim 16, wherein the nonionic impurities include at least one of polyalcohol and heterocyclic aromatic compound.

23. The hold transport material as claimed in claim 16, wherein the volume resistivity of the hole transport material is 10 Ω·cm or larger.

24. The hole transport material as claimed in claim 16, wherein the hole transport material includes at least one selected from the group comprising thiophene/styrenesulfonate-based compounds, arylcycloalkane-based compounds, arylamine-based compounds, phenylenediamine-based compounds, carbazole-based compounds, stilbene-based compounds, oxazole-based compounds, triphenylmethane-based compounds, pyrazoline-based compounds, benzine-based compounds, triazole-based compounds, imidazole-based compounds, oxadiazole-based compounds, anthracene-based compounds, fluorenone-based compounds, aniline-based compounds, silane-based compounds, thiophene-based compounds, pyrrole-based compounds, florene-based compounds, porphyrin-based compounds, quinacridon-based compounds,

phthalocyanine-based compounds, naphthalocyanine-based compounds, and benzidine-based compounds.

25. The hole transport material as claimed in claim 16, wherein the hold transport material contains a poly(thiophene/styrenesulfonate)-based compound as its major component.

26. The hole transport material as claimed in claim 25, wherein the poly(thiophene/styrenesulfonate)-based compound has a weight ratio of thiopene to styrenesulfonate which is in the range of 1:5 to 1:50

27. A layer having the function of transporting holes and provided in an organic EL device, wherein the layer is characterized by containing anionic impurities, cationic impurities and nonionic impurities having a molecular weight of 5,000 or less, but amounts of the anionic impurities, cationic impurities and nonionic impurities are 1,500 ppm or less, 1500 ppm or less and 2,000 ppm or less, respectively.

28. The layer as claimed in claim 27, wherein the total amount of the anionic impurities, cationic impurities and nonionic impurities is 4,500 ppm or less.

29. A layer having the function of transporting holes and provided in an organic EL device, the layer being characterized by being formed from a material containing the hole transport material described in claim 1 as its major component.

30. An organic EL device having a layer described in claim 27.

31. A method of manufacturing a hole transport material described in claim 16, the method comprising the steps of:

preparing a solution or dispersion liquid in which the hole transport material is dissolved or dispersed in a solvent or a dispersion medium;

separating or eliminating anionic impurities, cationic

impurities and nonionic impurities having a molecular weight of 5,000 or less using a first eliminating means for separating or eliminating the anionic impurities, a second eliminating means for separating or eliminating the cationic impurities, and a third eliminating means for separating or eliminating the nonionic impurities at substantially the same time or successively; and

removing the solvent or dispersion medium from the liquid, thereby refining the hole transport material.

32. The method of manufacturing a hole transport material as claimed in claim 31, wherein the third eliminating means includes an ultrafiltration membrane.